90-1744

Supreme Court, U.S.
FILED
JUL 19 1990
JOSEPH F. SPANIOL, JR.
CLERK

No. 90-

IN THE

Supreme Court of the United States

OCTOBER TERM, 1990

SAFE FLIGHT INSTRUMENT CORPORATION,
Petitioner,

v.

SUNDSTRAND DATA CONTROL, INC.,
Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

PETITION FOR WRIT OF CERTIORARI

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July 19, 1990

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QUESTIONS PRESENTED

The FAA requires planes to carry a device to warn of "microburst windshear," the largest weather-related cause of airline deaths. Petitioner holds the first patent on any such device. Its novelty is that it measures the effect of downward wind on a plane's performance, combining this figure with a measure of a less harmful and previously known phenomenon, horizontal windshear, to warn of microburst windshear.

Respondent began making a microburst windshear warning device identical to petitioner's except that, in deriving the horizontal windshear component, it combines two electronic signals before subtracting their sum, rather than subtracting them one by one. The Federal Circuit, deeming a finding of infringement under the doctrine of equivalents to require equivalence not of the two devices each taken as a whole, but of *each element* of each of the two devices, held for respondent. These questions arise:

1. Where anyone, by exploiting a simple algebraic identity, can easily make such a functionally irrelevant change to a signal within *any* device that incorporates electronic signal processing — devices such as computers, compact disc players, and those used in satellite technology, cable television, and a vast array of other industries — does the Federal Circuit's blueprint for circumventing patent protection comport with this Court's holding in *Graver Tank* that a patent is infringed by any device that "performs substantially the same function in substantially the same way to obtain the same result?"

2. Where a patented innovation includes a patented subcomponent (here, the device for separately measuring the horizontal windshear), and where the subcomponent forms no part of the "innovative concept" which the overall patent describes, may restrictions conceded in order to support the patentability of the subcomponent be used to limit the protection given to the entirely independent innovation of the overall patent?

PARTIES TO THE PROCEEDING

Safe Flight Instrument Corporation has no parent company, nor any nonwholly owned subsidiaries.

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OPINIONS BELOW

The decision and opinion of the Court of Appeals for the Federal Circuit are unreported and reprinted as Appendix A at page A1. The opinion and order of the United States District Court for the District of Delaware on Safe Flight's motion for reconsideration are unreported and reprinted as Appendix B at page A3. The opinion of the district court granting summary judgment for respondent is reported at 706 F. Supp. 1146. It is reprinted along with the order of the district court as Appendix C at page A16.

JURISDICTION

The judgment of the United States Court of Appeals for the Federal Circuit was entered on March 22, 1990. A timely petition for rehearing was denied on April 20, 1990. See Appendix D at page A37. The jurisdiction of this Court is invoked pursuant to 28 U.S.C. § 1254(1).

CONSTITUTIONAL PROVISION AND STATUTE INVOLVED

Article 1, § 8, Clause 8 of the United States Constitution reads:

> The Congress shall have Power . . . to promote the Progress of Science and useful Arts, by securing for limited times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries . . .

Title 35, United States Code, § 271(a) reads:

> **§ 271. Infringement of patent**
>
> (a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

STATEMENT OF THE CASE

1. *Introduction*

Microburst windshear has been the largest single meteorological cause of commercial airplane deaths in the United

States. In 1988, the Federal Aviation Administration adopted a regulation requiring all commercial aircraft to be equipped with a microburst windshear warning device.

Petitioner holds the first patent on any such device. It also holds a patent on a more modest device for measuring less harmful horizontal windshear. The novelty of the new microburst warning patent is that it measures the effect of downburst, an isolated patch of downward wind, on an airplane's performance. The microburst windshear warning device incorporates as a subcomponent the old horizontal windshear mechanism: In the microburst windshear warning device, the horizontal windshear measurement is added to the downburst measurement to give a warning for total microburst windshear.

Another company, respondent here, began making a microburst windshear warning device that is identical, except that before subtracting the two electronic signals that must be deducted in calculating the horizontal windshear component, it first adds the two together and then subtracts their sum, rather than subtracting them one at a time. This rearrangement in the process for calculating the horizontal windshear, or "H", amounts to nothing more or less than computing $H = A - (B + C)$ instead of $H = (A - B) - C$.

By avoiding the generation of any separate electronic signal for $(A - B)$, this rearrangement creates a situation in which the signal moving through one wire of respondent's device differs from the corresponding signal in petitioner's device. The Federal Circuit Court of Appeals, holding that there is no infringement under the doctrine of equivalents unless each "element" of the patented device is included in a copy, found for the respondent. The court also held that the scope of the overall patent was limited by the prosecution history of the subcomponent horizontal windshear patent, because the former incorporates the language used in the earlier patent to describe the horizontal windshear device.

2. *Summary*

In this case the Court of Appeals for the Federal Circuit has imposed a regime for evaluating patent infringement claims that effectively removes, from all devices that use or generate electronic signals, the most important part of the protection afforded inventions under the patent law. The Court of Appeals did further violence to the patent system of economic incentives for both innovation and its disclosure by applying its new regime in such a way as to narrow drastically the patent protection available to all new inventions that incorporate older inventions of more limited scope.

While devices that process electronic signals are not new, they are of increasing importance to the world economy: computer hardware, artificial intelligence, digital devices such as compact disc players and compact disc random access memory devices, hardware for scrambling and transmitting satellite and cable television broadcasts — all will be affected by the decision of the Federal Circuit Court of Appeals in this case. At precisely the time when economic competition has taken on greater global significance, the Federal Circuit has chosen to restrict the protection given this broad class of devices; it has done so in the face of the teachings of this Court and the basic principles and values underlying both the constitutional grant to Congress of the patent power and the federal patent law enacted thereunder.

Furthermore, in a world of increasing technological innovation, the importance of devices that incorporate previous inventions has increased exponentially. Rarely is it the case that an invention of economic and social significance will be produced of whole cloth by a single person. The genius of invention often lies in a person's ability to take existing inventions of little significance, to bring them together in a different way, or to add an inventive concept in order to make them useful.

This the law of patents has long acknowledged. Yet the Court of Appeals for the Federal Circuit in this case has adopted reasoning that suddenly constricts the protection given such cumulative inventions, leaving it lifeless and sterile. The Court of Appeals, in a brief opinion, adopted the reasoning of the district court.[1] Yet the fact that the Court of Appeals proceeded summarily, as though a routine matter were at hand, does not diminish the far-reaching implications of its decision. Indeed, the threat of a radical transformation of the patent law is perhaps greatest when the Court of Appeals for the Federal Circuit acts in just such an off-hand manner.

The Court of Appeals decision has constricted patent protection in two ways. First, it has transformed the traditional test for determining whether there is "equivalence" between a patented device and a challenged one. The Court of Appeals has replaced the broad and flexible test prescribed by this Court in the leading case of *Graver Tank & Mfg. Co.* v. *Linde Air Products Co.*, 339 U.S. 605 (1950) — a test in which a patent protects its inventor from a copy of his invention which is its substantial equivalent — with a more mechanistic test in which *each element* of the accused device must have an *equivalent element* in the patented invention before infringement will be found. This element-by-element test for equivalence imposes a requirement of nearly-literal infringement that is at odds with the equitable "doctrine of equivalents" carefully crafted by this Court over the past century and a half. In this case that error is compounded by the Court of Appeals' willingness to treat the presence of a particular isolated electronic signal within a device as an "element" of a patent. This will make circumven-

[1] In her opinion for the Court of Appeals, Judge Nies wrote that "[t]he district court gave thoughtful and careful analysis to all of the issues raised by Safe Flight in both its opinion granting summary judgment and that denying Safe Flight's motion for reconsideration. Accordingly, we affirm on the basis of the opinions below." Appendix at A2 ("A2").

tion of the Court of Appeals' element-by-element test child's play for would-be copyists of any device that processes electronic signals.

Second, the Court of Appeals has departed from the principles that underlie the protection of invention granted by Congress under its patent power by using conclusions about the scope and history of a first patent to restrict the protection given a device claimed in a second patent that happens to incorporate the first invention as a subcomponent. By focussing on restrictions contained in an earlier patent, rather than on the inventive concept actually protected, the Court of Appeals has dangerously narrowed the protection of all devices that incorporate earlier inventions. This is an enormous class of patents including many inventions of commercial and social significance.

Of course, since 1982, only one Court of Appeals has had jurisdiction over questions of patent law. There can, therefore, be no possibility of a "circuit conflict" on questions of federal patent law. But neither is there an opportunity for any judicial tribunal other than this Court to reconsider and examine the reasoning and analysis that underlies the decisions announced by the Federal Circuit. This Court therefore has a special responsibility in the area of federal patent law. No decision with implications so grave for our economic development as that in this case should be allowed to stand without review.

3. *Background*

Petitioner Safe Flight Instrument Corporation ("Safe Flight") seeks review of a judgment of noninfringement by the United States Court of Appeals for the Federal Circuit. The district court had original jurisdiction of this action under 28 U.S.C. § 1338(a).

Two Safe Flight patents are involved in this case. The first, U.S. Patent No. 4,012,713 ("the horizontal windshear patent" or

"the first patent"),[2] is for an airborne warning device for "horizontal windshear" — sudden, localized gusts of wind. The horizontal windshear patent describes a device that would be carried on an airplane and that would trigger an alarm when horizontal windshear around the plane reaches a critical level. Since very few accidents are caused by horizontal windshear, this first patent is of limited commercial utility.

The second patent, U.S. Patent No. 4,079,905 ("the microburst warning patent" or "the second patent"),[3] describes an airborne warning device that measures "microburst windshear" around the airplane and triggers an alarm when it reaches a critical value. Microburst windshear is an unusual meteorological phenomenon in which there is a downdraft — a forceful, isolated patch of downward wind. It can be extremely hazardous to aircraft, particularly those attempting to land. The novel feature of the second patent is that it contains a means for measuring downdraft, and for using that measurement to determine the change of the angle of descent of an aircraft caused by the downdraft. To give the pilot a total microburst windshear signal, the horizontal windshear measurement is added to this "downdraft drift angle": the patent for the microburst warning device incorporates the description of the horizontal windshear measurement device used in the horizontal windshear patent. The microburst warning patent covers the first airborne device of any kind for the measurement of microburst windshear.

The importance of this Safe Flight patent cannot be overemphasized. The very existence of the microburst windshear phenomenon was not known until 1975, yet it is now believed that microburst windshear was responsible for hundreds of fatalities in many commercial air disasters prior to that time

[2] The courts below referred to this as "the '713 patent."

[3] The courts below referred to this as "the '905 patent."

that had previously been attributed to pilot error. Indeed, between 1964 and 1983, microburst windshear caused 28 commercial airline accidents in the U.S. during takeoff or landing. *See* 52 Fed. Reg. 20,560 (1987) (Notice of Proposed Rulemaking). Following a fatal airline disaster at Kennedy Airport on June 24, 1975, investigation of microburst windshear was intensified, and in 1976 Dr. T.T. Fujita of the University of Chicago first published a detailed description of the microburst phenomenon. This was perhaps the most important scientific discovery in airline safety in the postwar period. And indeed, in 1988, the Federal Aviation Administration adopted a regulation requiring all large commercial airliners to carry a microburst windshear warning device. 14 C.F.R. § 121.358 (1990).

The Boeing Company ("Boeing"), recognizing the need to incorporate an effective airborne windshear warning device on its new models of aircraft, entered into an agreement with Safe Flight. Rather than manufacture the microburst warning device itself, Safe Flight licensed the Boeing Company to manufacture, or to engage a third party to manufacture, devices in accord with its two patents. Boeing then engaged Respondent Sundstrand Data Control, Inc. ("Sundstrand") to manufacture the windshear device. Sundstrand did so — indeed, it printed the Safe Flight patent numbers on its device — but then claimed that its device was not covered by the Safe Flight patents. Sundstrand proceeded to make its device commercially available.[4]

4. *The Decision Below*

The only difference claimed by Sundstrand between the Sundstrand device and Safe Flight's is in the portion of the

[4] Sundstrand made three versions of its device, all of which Sundstrand concedes are identical in all respects relevant to this litigation. *See* Brief for Appellee in the Court of Appeals at 11 and n.7; (A19 n.2).

device that measures *horizontal* windshear. The district court held that if the subcomponent horizontal windshear patent was not infringed, then the overall microburst warning patent, which includes a description of the means for producing the horizontal windshear signal identical to that contained in the horizontal windshear patent, was not infringed. Appendix at A17 ("A17").

a. *The Doctrine of Equivalents*

The district court found first that the Sundstrand device does not literally infringe the horizontal windshear patent. It then examined the Sundstrand device for infringement under the "doctrine of equivalents." That cornerstone doctrine of patent protection was first enunciated by this Court in the venerable case of *Winans* v. *Denmead*, 56 U.S. (15 How.) 330 (1853). It was most recently explicated in the landmark case of *Graver Tank & Mfg. Co.* v. *Linde Air Products Co.*, 339 U.S. 605 (1950). There, this Court explained that a patent is infringed by any device that "performs substantially the same function in substantially the same way to obtain the same result." *Id.* at 608 (quoting *Sanitary Refrigerator Co.* v. *Winters*, 280 U.S. 30, 42 (1929)).

b. *Element-by-Element Equivalence*

In applying the doctrine of equivalents in this case, the district court required the comparison not of the two devices each taken as a whole, but of *each element* of each of the two devices. This approach was first taken by the Federal Circuit Court of Appeals in *Pennwalt Corp.* v. *Durand-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987) (en banc), *cert. denied*, 108 S.Ct. 1226 (1988), a case the district court followed here. Under *Pennwalt*, to support a finding of infringement the reviewing court must find each element of the patented device

or its equivalent in the alleged infringing product. That *Pennwalt* departed from this Court's teachings became clear in this case from the district court's treatment of an isolated electronic signal as an "element" for which the patentee must show equivalence. Some background is in order.

c. *The Operation of the Devices*

Horizontal windshear can be measured by comparing the rate of change of the speed of the aircraft with respect to the surrounding air ("instantaneous airspeed") with the rate of change of the speed of the aircraft with respect to the earth ("groundspeed"). A sudden increase in a plane's airspeed, its rate of change of speed with respect to the air around it, unaccompanied by a similar change in the plane's rate of change of speed with respect to the ground, will signal a sudden change in the wind surrounding the plane. This is horizontal windshear.

Both the Safe Flight horizontal windshear device and the circuit for measuring horizontal windshear within the Sundstrand device begin by measuring the actual airspeed and the horizontal acceleration (i.e., the change in groundspeed). But to detect windshear, one needs the difference between change in airspeed and change in groundspeed. In the Safe Flight horizontal windshear device, the airspeed and horizontal acceleration signals are kept separate. The airspeed signal is split in two, and one half is sent through a "filter" that delays the signal slightly. This delayed airspeed signal is then subtracted from the current airspeed signal to determine the rate of change of airspeed. From this signal the horizontal acceleration is then subtracted, thereby producing the horizontal windshear signal. A diagram may be helpful:

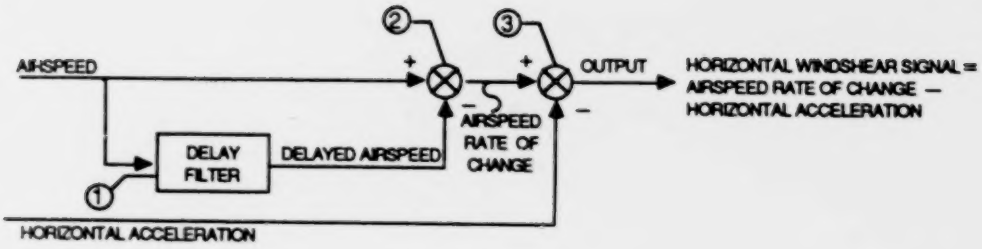

Fig. 1.

The Sundstrand device also splits the airspeed signal in two. However, in this device, half the airspeed signal is initially superimposed on the horizontal acceleration signal. This combined signal is then delayed by being sent through a "filter." This signal is then subtracted from the current airspeed signal, simultaneously reducing the airspeed signal to that of its instantaneous rate of change and subtracting the horizontal acceleration from that. (In cases of high windshear, the horizontal acceleration is virtually constant, and so the fact that the horizontal acceleration that is subtracted from the current airspeed is slightly delayed, or "filtered," has no practical effect on the final signal that comes out of the device.) The result, precisely as in the Safe Flight device, is a signal representing the horizontal windshear:

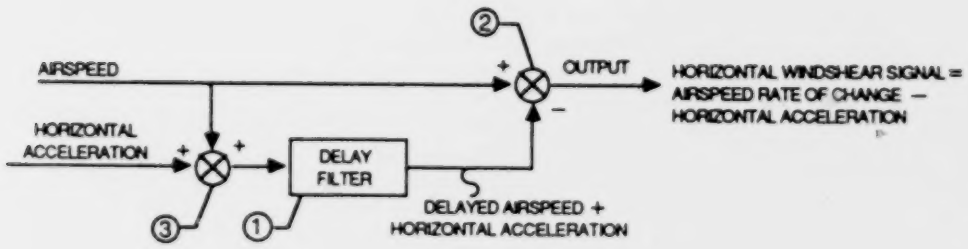

Fig. 2.

As anyone can see, the Sundstrand Device and the Safe Flight device for measuring horizontal windshear contain exactly the same components. In the Sundstrand device they have simply been rearranged slightly. Although both devices measure and produce a signal for horizontal windshear through precisely the same process, the district court remarkably held that, as a matter of law, the presence of the *isolated* signal for the rate of change of the airspeed was one of the "elements" that had to be identical in order for the horizontal windshear patent, and hence the overall microburst warning patent, to be protected by the doctrine of equivalents. (*See* A27).

d. *The Patent for the Microburst Warning Device and Its Range of Equivalents*

As to the measurement and incorporation of the crucial downdraft drift angle into the final signal for total microburst windshear, it is undisputed that in all respects relevant to this appeal the Sundstrand device and the product described in the microburst warning patent are *identical*.

The range of equivalents that will be permitted a patent varies with the scope of the invention. An invention that is a significant development over the prior art will be accorded more deference than one that is but a minor advance. Yet here the district court held, without reference to the scope of the invention claimed in each patent, that because the microburst warning patent incorporated claim language from the horizontal windshear patent, the range of equivalents to be afforded the second patent could be no broader than that afforded the first. The district court held that the Sundstrand device does not infringe the horizontal windshear patent and that, therefore, it does not infringe Safe Flight's patent for the microburst warning device either. (*See* A17, A27).

e. *File-Wrapper Estoppel*

The district court then found that, even if the Sundstrand device were the equivalent of that protected by the microburst warning patent or the horizontal windshear patent, Safe Flight was estopped from taking advantage of the doctrine of equivalents here because of the prosecution history of the horizontal windshear patent.

It is a corollary of the equitable doctrine of equivalents that the patentee may not "recapture through equivalence certain coverage given up during prosecution." *See Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d 861, 870 (Fed. Cir. 1985). This is the concept of "file-wrapper" estoppel — estopping the patentee from pleading that his invention covers that which he had to deny it covered in order to receive the patent in the first place.

After examining the prosecution history of the horizontal windshear patent, the district court held that, in order to distinguish its patent from the prior art, Safe Flight had been required to draft its horizontal windshear patent claim narrowly. (A28). The horizontal windshear patent contains as an element the "means for generating a signal representing the rate of change of the instantaneous air speed" of the aircraft. The word "representing" was required in the prosecution of that patent to distinguish the horizontal windshear device from prior art in which a signal was produced "in accordance with" (i.e., as a function of) the rate of change of instantaneous airspeed. The district court construed the word "representing" to require that the signal for rate of change of instantaneous airspeed exist at an intermediate point within the horizontal windshear measurement device independent of any other signal. (A28-29). Thus, under the district court's construction, no device that does not have that isolated signal can infringe the horizontal windshear patent under the doctrine of equivalents, regardless of the equivalence of the steps taken within it to calculate horizontal windshear.

Because the phrasing from the horizontal windshear patent was incorporated in describing the means for generating the horizontal windshear signal in the subsequent microburst warning patent, the district court held that the narrowing that took place in the prosecution history of the horizontal windshear patent was incorporated in the patent for the microburst warning device. (A28-A29 n.6). Consequently, in the opinion adopted by the Court of Appeals, the ruling of non-infringement of the first patent on grounds of file-wrapper estoppel was also held to require a finding of non-infringement of the second patent.

REASONS FOR GRANTING THE WRIT

I. A. The Requirement of Element-By-Element Equivalence Perverts the Doctrine of Equivalents.

In requiring an equivalent for each element of a claimed invention, the Court of Appeals has sapped the doctrine of equivalents of all vitality.

That doctrine, most recently explained by this Court in *Graver Tank & Mfg. Co.* v. *Linde Air Products Co.*, 339 U.S. 605 (1950), is equitable in nature. It is intended to protect the inventor, and his or her investment, from minor changes in an accused device. Under the doctrine of equivalents there is no requirement of literal infringement. As the Court stated in *Graver Tank*, "[t]he theory on which [the doctrine of equivalents] is founded is that 'if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form or shape.'" *Graver Tank*, 339 U.S. at 608 (citation omitted).

The whole point of the doctrine is that each element of an invention need not be identically present in an accused device to support a finding of infringement. "Something is substan-

tially equivalent if the skilled practitioner would know of the *practical interchangeability* of the accused infringement's elements with those specifically identified in the patent specification." A. Miller & M. Davis, *Intellectual Property* 125 (1983). The doctrine "prevents the elevation of form over substance that otherwise might allow a canny infringer to avoid the exact duplication of an invention while still capitalizing upon the work of the inventor." *Id.* at 125-26.

By requiring instead that each element of the claimed invention or its substantial equivalent be present in the accused device, the Federal Circuit Court of Appeals has artificially narrowed the economic incentives for innovation that the Supreme Court sought to provide in *Graver Tank*. The implications of requiring element-by-element equivalence may not have been obvious on the facts of *Pennwalt Corp.* v. *Durand-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987) (en banc), *cert. denied*, 108 S. Ct. 1226 (1988), the first case in which a sharply divided Court of Appeals for the Federal Circuit applied the doctrine of equivalents in this form. In that case the Court of Appeals compared machines which, although they both sorted fruit, appeared to work in completely different ways: the patented machine kept track of the physical location of the fruit as it moved through the sorter while the challenged device did not. *Id.* at 935-36. Even under a proper application of *Graver Tank* in that case, a court might not have been able to find that the function of the two machines was carried out "in substantially the same way." In this case, by contrast, the ramifications of requiring "element-by-element" equivalence are all too apparent.

Sundstrand, by trivially rearranging the elements of the circuit for measuring horizontal windshear, has done precisely what the *Graver Tank* Court sought to prevent. In that case this Court explained that the doctrine of equivalents would discourage "the unscrupulous copyist [from] mak[ing] unim-

portant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of the law." *Graver Tank*, 339 U.S. at 607.

This is *exactly* what element-by-element equivalence permits. Under this formulation, as the district court in this case held, "a court cannot merely view an invention as a whole, rather it must perform an element-by-element analysis of the patent in suit and must find that each element in the claimed invention, or its equivalent, is found in the alleged infringing product." (A23).

It may well be easier to apply this mechanical method than to adhere faithfully to the doctrine of equivalents as it has been announced by this Court. But the admonition endorsed by the Court of Appeals not to "merely view an invention as a whole" is irreconcilably at odds with the teachings of this Court. For the law of patents is intended precisely to protect the "benefit of the invention," *Graver Tank*, 339 U.S. at 608 (quoting *Royal Typewriter Co.* v. *Remington Rand*, 168 F.2d 691, 692 (2d Cir. 1948) (L. Hand, J.)). "[A] patentee may invoke this doctrine [the doctrine of equivalents] to proceed against the producer of a *device* 'if it performs substantially the same function in substantially the same way to obtain the same result.' " *Id.* (emphasis added).

This the Sundstrand microburst warning *device* clearly does, whatever the district court's finding regarding the non-equivalence of one of its elements with one within Safe Flight's horizontal windshear patent. The microburst warning patent covers an invention that warns of microburst windshear by combining a measurement of horizontal windshear and downdraft drift angle. That a change in the placement of a single filter within the circuit for measuring horizontal windshear was enough to permit the Court of Appeals to find that there was no element-by-element equivalence demonstrates the way

in which such a requirement completely swallows the rule this Court has been so careful to preserve.

The literalism in examining claims for patent infringement that this Court long ago banished by the front door has now been snuck in through the back door. In case after case, a requirement that a patentee must show element-by-element equivalence before an accused device will be held to infringe will "convert the protection of the patent grant" into the "hollow and useless thing" about which this Court warned in *Graver Tank*. *Graver Tank*, 339 U.S. at 607. The economic cost of the limitation to the protection of new inventions that element-by-element equivalence will work is both unprecedented and immeasurable.

B. 1. Even if Element-By-Element Equivalence Were Necessary, Requiring Equivalence of an *Isolated Signal* as an "Element" of a Patent Effectively Removes All Devices that Incorporate Electronic Signal Processing from Within the Protective Reach of the Doctrine of Equivalents.

In this case the Court of Appeals held that there is no element-by-element equivalence between the Sundstrand device and Safe Flight's horizontal windshear patent because in the Sundstrand device there is no *isolated* signal representing the instantaneous rate of change of airspeed. (A27). The Court held that, as a matter of law, the *isolated* signal was an "element" of the Safe Flight claim. (*See* A27). Although both the Safe Flight horizontal windshear device and the circuit within the Sundstrand instrument measure horizontal windshear through exactly the same process, the court held that the absence of the isolated signal in the Sundstrand device meant that there was no equivalent for the isolated signal "element" of the patented device.

The appearance of an isolated signal at an intermediate stage in a device that incorporates signal processing is so insignificant, and the ease with which a practitioner of the art can alter a device to prevent a signal from appearing in an isolated way is so simple, that if patent law can regard an isolated signal as an "element" of a patent there will be *virtually no doctrine of equivalents protection for any device that incorporates signal processing*. This will affect all manner of electronic devices: computer hardware, compact disc players, video cameras and video cassette recorders, to name just a few. A simple illustration will demonstrate the magnitude of the damage that will be wrought by the rule adopted by the Court of Appeals.

Imagine that the following is a portion of a patented device that processes signals. The device produces the intermediate signal "C" as an isolated signal:

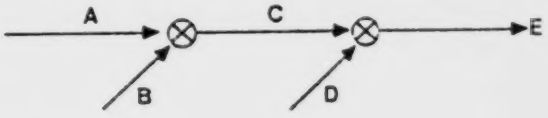

Fig. 3.

By simply adding an electronic masking signal ("M") of a given frequency at the beginning of the process and filtering it out at the end, a copyist using identical hardware will achieve the same result as the patented device, but without the presence of the isolated intermediate signal "C":

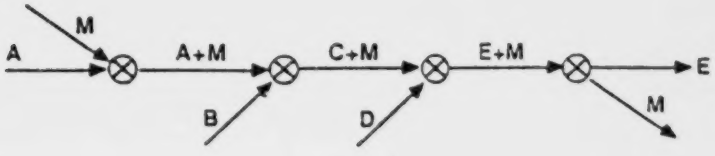

Fig. 4.

As this example demonstrates, the district court's failure to find equivalence because of the absence in the Sundstrand device of any one isolated signal to represent instantaneous rate of change of airspeed represents the end of doctrine of equivalents protection for a wide range of devices that incorporate signal processing. If the doctrine of equivalents is to fulfill its function of preventing the "subordinat[ion] [of] substance [to] form," *Graver Tank*, 339 U.S. at 607, then — at least as to the broad and increasingly important area of inventions that incorporate signal processing — the presence of an isolated signal cannot be treated as an independent "element" of a claim.

In the case at bar, the accused device brazenly exploits a universally known algebraic identity, the associative property of addition ($((A-B)-C) = (A - (B+C))$), to evade a finding of infringement. Because of this property, the rearrangement of the order in which signals are combined and subtracted within a wide range of devices that incorporate signal processing — be it computer, compact disc player, video camera, or whatever — will be of utterly no consequence. For example:

(Current Airspeed − Previous Airspeed) − Horizontal Acceleration

will always equal

Current Airspeed − (Previous Airspeed + Horizontal Acceleration)

In ordinary life, the sequence in which steps are taken often can make a crucial difference. A great deal will depend, for example, on whether one puts on a parachute first — or jumps first from the plane. Similarly, in some areas of invention a rearrangement of steps could represent a crucial inventive development. But in devices that add and subtract electronic signals from one another, it could not be clearer that this is not the case.

Another analogy may be useful: Imagine an invention for making a vodka-and-orange juice cocktail with no orange pits. It could start with fresh orange juice, and could filter the juice to remove the pits. This would create an "isolated" item: "pitless orange juice." The pitless orange juice could then be mixed with vodka to produce our vodka and fresh orange juice.

One can easily imagine another device in which only the order of these operations was changed. This second device would first mix the vodka with the fresh orange juice. It would then filter the mixture to remove the pits. In both cases, the same steps were taken in the production of our cocktail, but in the second case no "pitless orange juice" was generated as an isolated "element" in the intermediate step. This is similar to the way in which the horizontal windshear circuit in the Sundstrand device differs from that described by the horizontal windshear patent.

In either event, the inputs, the method and the outcome would be identical. And, under any traditional notion of the meaning of the doctrine of equivalents, the second vodka-and-orange-juice machine would infringe upon the patent for the first. Yet under the reasoning endorsed by the Court of Appeals, the second device would not infringe the first patent, because at an intermediate stage there was no "pitless orange juice" within the second device whereas there was in the first.

By determining that mere rearrangement of a signal within a device is sufficient to avoid the limitations imposed by the doctrine of equivalents, the Court of Appeals has ripped the cloak of patent protection from all devices that process electronic signals. From computer hardware to microcircuitry to electronic devices of all kinds, the Court of Appeals decision exposes to economic peril those who would labor to create new inventions.

That the Court of Appeals did so offhandedly and without discussion cannot be allowed to obscure the importance of its

action. To deprive a field with growing economic significance of the same patent protection enjoyed by other industries — indeed, to do so without discussion in either this Court or the court below — would be unprecedented. Without the protection from competition that the patent law is intended to provide — protection that, prior to the decision below, was uniformly assumed to exist — the economic incentive to innovate will vanish from this vital and increasingly important field. Without congressional action, and in a single stroke, the Court of Appeals will have eviscerated of all meaning doctrines that this Court has long labored to preserve. At a time in which devices that incorporate signal processing are taking on increasing economic importance, the United States can ill afford to be so hobbled by the lower court's ruling. Perhaps more fundamentally, under our system of government the adoption of any such policy must be the work of Congress — not the courts.

Of course, the Court of Appeals in this case also held that, even if there were "element-by-element" equivalence, the Sundstrand device was one for which protection had been given up in the prosecution history, because the court interpreted the words of limitation in the Safe Flight horizontal windshear patent claim — "means for generating a signal representing the rate of change of the instantaneous air speed" of the aircraft — to mean that that signal had to exist in isolated fashion within the device.

But this "answer" to Safe Flight's objection — essentially that it was Safe Flight itself that caused its predicament by seeking a patent on the basis of the existence of an isolated signal within its horizontal windshear device — is no answer at all. The Court of Appeals' conclusion founders on the same shoals that lead Safe Flight to seek certiorari: an "isolated signal" — as opposed to the *means of generating* a signal — cannot as a matter of law be an "element" of a patent. Yet the Court of Appeals' very interpretation of the Safe Flight patent

is premised on just that possibility. (*See* A28-A29) (finding that the presence of the isolated signal in the horizontal windshear patent was crucial to its patentability).

The construction of a patent is a question of law, and it is a fundamental canon of construction of patent claims that "patents should, if practicable, be so interpreted as to uphold and not to destroy the right of the inventor." 6 *Walker on Patents* § 21:2, 267 (Lipscomb ed. 1987). "The canon *ut res magis valeat quam pereat* ['that the thing may rather have effect than be destroyed'], applies with particular force to patent claims." *Id.* In the district court, Sundstrand did bring a counterclaim that the horizontal windshear patent is invalid — a claim that was reached neither by the district court nor by the Court of Appeals. Should this Court agree with our contention that as a matter of law an isolated signal cannot be an element of a patent, at most Sundstrand would be entitled to a remand to permit the Court of Appeals to interpret again the horizontal windshear patent in light of this canon of construction that favors a finding of validity.

2. The Court of Appeals' Attempt to Evade This Conclusion by Invoking the Homily That One Cannot Patent a Law of Nature Distorts That Doctrine and Conflicts With This Court's Recent Decision in *Diamond* v. *Diehr*.

The Court of Appeals suggested that, if it did not limit the Safe Flight horizontal windshear patent to cover only a device in which the isolated rate of change of instantaneous airspeed signal appeared, it would in effect be permitting Safe Flight to patent the windshear equation. (*See* A31-34). It is, of course, beyond peradventure that one cannot patent an equation or a law of nature. *See, e.g., Diamond* v. *Diehr*, 450 U.S. 175, 185 (1981). But Safe Flight has never tried to patent the windshear equation, nor need the Court permit an isolated

signal to be an element of a patent in order to protect the principle that a law of nature is unpatentable subject matter. This Court has stated that, while a mathematical formula is not patentable, "when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect . . . , then the claim satisfies the requirements of [35 U.S.C.] § 101." *Id.* at 192.[5] The Safe Flight device described by the horizontal windshear patent is an airborne device for measuring horizontal windshear from certain inputs and sounding an alarm when it reaches a certain value. (In the patent for the microburst warning device, this is incorporated in a device that measures downdraft drift angle and sounds an alarm when microburst windshear reaches a critical value.) Safe Flight seeks protection against copies of its devices that take the same inputs and avoid infringement only by irrelevantly eliminating the isolated presence of a certain signal.

In attempting to avoid the conclusion that an isolated signal could not be an "element" of a patent in application of its "element-by-element" approach to the doctrine of equivalents, the Court of Appeals ignored this Court's fundamental teaching that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." *Parker* v. *Flook*, 437 U.S. 584, 590 (1978). Here, as in *Diamond* v. *Diehr*, the "process admittedly employs a well-known mathematical equation, but [the patentee] do[es] not seek to pre-empt the use of that equation. Rather, [it] seek[s] only to foreclose from others the use of that equation in conjunction with all of the other steps in [its] claimed process." *Diamond* v. *Diehr*, 450 U.S. at 187.

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[5] 35 U.S.C. § 101 reads:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Safe Flight seeks only protection from infringement by substantial equivalents of its patented devices. Other inventors remain free to determine the presence of windshear by the use of other inputs — even in making a horizontal windshear warning device. They also remain free to measure horizontal windshear and use it in devices that are substantially different: as a ground-based warning system for aircraft, as a meteorological tool, or whatever. Safe Flight does not, nor could it, seek to "enjoy complete insulation from any company that marketed a product that produces a windshear signal," (A33), nor from the manufacture of any device from which one could deduce the presence of windshear.

Safe Flight's horizontal windshear patent describes only an airborne, horizontal windshear warning device. That this necessarily utilizes the windshear equation no more prevents its patentability than the utilization of a law of nature prevents the patentability of a thermostat.

II. The Use of the Prosecution History of One Patent to Narrow the Scope of a Patent for a Second, "Cumulative" Invention — One Which Incorporates the Earlier Device — Eviscerates the Protection to Which Such Inventions are Entitled Under the Doctrine of Equivalents.

Inventors, like scientists, stand on the shoulders of those who came before them. Because of the increasing technological complexity of our world, more and more inventions inevitably incorporate ideas and inventions made by their predecessors. The purpose of "promot[ing] the Progress of Science and useful Arts" enshrined in the constitutional grant of the patent power to Congress, U.S. Const. Art. I, § 8, cl.8, would be defeated if this inevitable fact of "cumulative" invention became the engine for the destruction of the patent laws. Yet nothing less

is at stake in the misleadingly brief opinion of the Court of Appeals below.

It is hornbook patent law that "the inventor is entitled to a range of equivalents commensurate with the scope of his invention: broad if his invention is broad; narrow if his advance is a small one in a crowded field." 6 *Walker on Patents* § 22:34, 546 (Lipscomb ed. 1987); *Nelson* v. *Batson*, 322 F.2d 132, 135 (9th Cir. 1963). The scope of an invention is a question of law. "Primary" or "pioneering" patents are provided the broadest range of protection under the doctrine of equivalents. As this Court explained long ago, a pioneer patent is one "of such novelty and importance as to mark a distinct step in the progress of the art, as distinguished from a mere improvement or perfection of what had gone before." *Westinghouse* v. *Boyden Power Brake Co.*, 170 U.S. 537, 562 (1898). A pioneer patent is provided the widest range of equivalents. Similarly, "patents of substantial scope are entitled to a correspondingly substantial range of equivalents." 6 *Walker on Patents*, §22:43, 565 (Lipscomb ed. 1987). Finally, "[a]n invention of a limited nature is entitled to a narrow range of equivalents." *Id.* (emphasis omitted). As this Court has said, "the range of equivalents depends upon and varies with the degree of invention." *Continental Paper Bag Co.* v. *Eastern Paper Bag Co.*, 210 U.S. 405, 415 (1908).

The Court of Appeals manifestly erred in permitting the history and scope of the *horizontal windshear patent* to limit the range of equivalents permitted the *patent for the microburst warning device*. After observing that the horizontal windshear patent included the limitation that it generate signals "representing" certain values, the district court concluded that "[t]he '905 patent [the patent for the microburst warning device] was similarly worded to avoid the same problems. Thus our analysis of the effect of the term 'representing' in the horizontal wind-

shear patent applies to the '905 patent, as well." (A28-A29 n.6). And, in its opinion on reconsideration — also adopted by the Court of Appeals — the district court even referred to "*arguments* [Safe Flight] made to the [Patent & Trademark Office] identical to the arguments made . . . to distinguish the [horizontal windshear patent] over the prior art," to "limit the scope of the . . . patent [for the microburst warning device]," (A7), as though the relationship between the earlier, subcomponent patent and the prior art could somehow confine the advance made by the second, overall patent simply because the second included the first!

But in examining how large an advance over the prior art was made by a cumulative invention — one that incorporates some technology protected by an earlier patent — it is obviously irrelevant to inquire how large or small an advance that earlier patent had itself made over the prior art. The microburst warning patent describes the first device to measure downdraft drift angle and warn of microburst windshear — a device of great commercial usefulness that is now required by the FAA on all major commercial aircraft. The horizontal windshear patent covered a far more modest development in the field of horizontal windshear. It is as though the scope of equivalents to be provided the patent for the *telephone* were to be based on the novelty of the particular type of *bell* the inventor chose to use in it. This is a flagrant abandonment of the rule that the scope of equivalents to be permitted an invention depends on the novelty of *that* invention.

By adopting a method in which the narrowness of an invention in an earlier patent limits the range of equivalents provided a later patent, the Court of Appeals for the Federal Circuit has unilaterally stripped all cumulative inventions of any independent protection under the doctrine of equivalents. In this case, whatever the scope of the invention in the horizontal windshear

device covered by the horizontal windshear patent, the microburst patent was indisputably the first patent for a device that measured downdraft drift angle and that could therefore be used to warn of the effects of the hazardous phenomenon of microburst windshear. Indeed, the microburst warning patent had to be distinguished over and above the horizontal windshear patent which was by then itself part of the prior art.

Similarly, the court below expanded the concept of file-wrapper estoppel without warrant in permitting the prosecution history of the earlier horizontal windshear patent to estop a claim of infringement of the invention claimed in the later patent for the microburst warning device. File wrapper estoppel, of course, is a fitting and necessary corollary to the doctrine of equivalents. It is only just that an inventor not be permitted to gain back by the doctrine of equivalents that which he had to give up in order to receive the patent in the first place. But in finding that the Sundstrand device did not infringe the later patent, the Court of Appeals has pushed this estoppel concept into new territory. That court has held that a patentee can be estopped based on the prosecution history *not* of the patent in question, but of a *previous* patent that describes one version of one component of the patentee's new invention, a component that does not form a part of the novelty, utility or nonobviousness (the requisite elements of patentability, *see* 35 U.S.C. §§ 101, 102, 103) of the newly patented device.

By using a new patent's incorporation of phraseology from an old patent to impose a requirement that infringement of the new patent will be found only where the old patent is infringed, the Court of Appeals has alarmingly short-circuited the patent law's protection of cumulative inventions — those inventions that, as "new and useful improvement[s]" of existing processes, machines, manufactures, or compositions, are given express protection under the federal patent law. 35 U.S.C. § 101.

It is true, and hardly surprising, that, as the district court observed, the specification in the overall microburst warning

patent describes the means for producing the horizontal windshear signal in the same way as does Safe Flight's prior horizontal windshear patent. But "construction of a patent is to be made in the context of the patent subject matter as a whole, *particularly with respect to the inventive concept*." 6 *Walker on Patents* § 21.40, 393 (Lipscomb ed. 1987) (emphasis added). An artificially narrow reading of wording not relevant to the inventive concept itself would automatically bind an inventor to the technology of which he was aware when he made his claim. Yet "[a]n applicant for patent is required to disclose the best mode then known to him for practicing his invention. 35 U.S.C. § 112. He is not required to predict all future developments which enable the practice of his invention in substantially the same way." *Hughes Aircraft* v. *United States*, 717 F.2d 1351, 1362 (Fed. Cir. 1983).

The use of the prosecution history of a first patent to bar an infringement claim concerning a second patent flies in the face of the basic tenet of patent law that each patent must cover a *separate invention*. Indeed, were it otherwise, the 17-year statutory limitation might be circumvented by an inventor claiming additional patents incorporating his original invention. But of course, a bedrock principle of patent law is that double patenting of one invention is prohibited. A patentee is not entitled to more than one patent for a single invention. *See, e.g., In Re Longi*, 759 F.2d 887, 892 (Fed. Cir. 1985). *Just as an inventor cannot benefit by incorporating an important earlier invention in a modest new patent, he should not be hobbled by the incorporation of a modest earlier invention in a new, important patent.*

The invention in the patent for the microburst warning device is, most assuredly, not the horizontal windshear detector already patented in the horizontal windshear patent. The invention — the inventive concept — patented is the device for measuring downdraft drift angle which when incorporated with

a signal representing horizontal windshear gives a total signal for microburst windshear. Any limitation in the patent for the incorporated horizontal windshear device, an earlier invention patented in the horizontal windshear patent, is simply of no relevance to the scope of the "invention" protected by the patent for the microburst warning device. This has been the premise of a long line of patent decisions in this Court. Nearly a century ago, for example, this Court held that, because it was inconsequential to the invention, an element that was *expressly described in the claim* — in that case an encasement for a valve — was "immaterial" to the question of infringement. *Westinghouse* v. *Boyden Power Brake Co.*, 170 U.S. 537, 561 (1898).

In holding that a patent is narrowed by a limitation that happens to be included in an earlier patent *but that is not relevant to the innovation in the second patent*, the Federal Circuit Court of Appeals has drastically narrowed the doctrine of equivalents with regard to the entire class of "new and useful improvements" on existing inventions. Under the rule approved by the Court of Appeals, the very evils against which the doctrine of equivalents was intended to protect inventors — the use of "minor variations to conceal and shelter . . . piracy," "the subordinat[ion of] substance to form," *Graver Tank*, 339 U.S. at 607 — will sprout through every crack provided by the happenstance that one invention incorporates another. One slight alteration in the *component* invention, and the novel idea of the *second* inventor will be out of his control. Piracy and bootlegging will become for the clever a simple matter.

The economic incentives to innovation which the patent laws, and the enshrinement of congressional patent power in Article I, § 8 of the Constitution, are intended to foster will wither. Inventors and investors in whose inventions previous inventive concepts are incorporated — a class of inventions that

by definition grows with each technological development, and that appears to make up by far the major part of new inventions patented — "would be deprive[d] . . . of the benefit of [their] invention." *Graver Tank*, 339 U.S. at 607.

The rule of law adopted by the Court of Appeals will thus act as a disincentive to investment in a broad area of research and development, and will "foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system." *Id.*

This Court should not be misled by the bland and uninformative surface of the opinion issued by the Court of Appeals. As industry and technology have become more complex, the possibility of entirely new inventions that do not incorporate some previous technological development grows more and more remote. The stakes are therefore great. They cannot be measured by the sales of the respondent's microburst warning device alone — over $60 million annually — nor even by the number of lives saved by this one invention, but extend to the billions of dollars and to an immeasurable number of improvements in the quality of the lives of all.

CONCLUSION

For the foregoing reasons, certiorari should be granted.

Respectfully submitted,

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July 19, 1990

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APPENDIX A.

United States Court of Appeals for the Federal Circuit

89-1579

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff-Appellant,

v.

SUNDSTRAND DATA CONTROL, INC.,
Defendant-Appellee.

DECIDED: March 22, 1990

Before NIES, NEWMAN and MICHEL, *Circuit Judges*.
NIES, *Circuit Judge*.

DECISION

Safe Flight Instrument Corporation appeals from the final judgment of the United States District Court for the District of Delaware, 706 F. Supp. 1146, 10 USPQ2d 1733 (D. Del. 1989), granting the motion of Sundstrand Data Control, Inc., for summary judgment of noninfringement of Safe Flight Instrument Corp.'s U.S. Patents Nos. 4,012,713 ('713 patent) and 4,079,905 ('905 patent). We *affirm*.

OPINION

Contrary to Safe Flight's argument, the district court's opinion is not devoid of a separate analysis of the '905 patent. In the

court's original opinion, and more fully in its reconsideration opinion, the court explained its reasons for dealing with the '905 patent in less detail. Safe Flight's brief makes no substantive argument regarding infringement of the '905 patent that is not made in connection with the '713 patent.

Upon considering all of Safe Flight's arguments we have not been persuaded of legal error in the court's claim construction. Thus, its finding of no literal infringement is not clearly erroneous. We also find no error in the court's standard for determining infringement under the doctrine of equivalents under the precedent of this court or its application of the standard to the facts of this case. Furthermore, we are not persuaded that there were genuine issues of material fact which precluded granting summary judgment. The district court gave thoughtful and careful analysis to all of the issues raised by Safe Flight in both its opinion granting summary judgment and that denying Safe Flight's motion for reconsideration. Accordingly, we affirm on the basis of the opinions below.

APPENDIX B.

In the United States District Court for the District of Delaware.

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff,

v.

Civil Action No. 87-545 JRR

SUNDSTRAND DATA CONTROL, INC.,
Defendant.

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Attorneys for Defendant.

MEMORANDUM OPINION

As amended June 27, 1989.

ROTH, District Judge

The plaintiff in this action, Safe Flight Instrument Corporation ("Safe Flight"), filed suit against the defendant, Sundstrand Data Control, Inc. ("Sundstrand"), for alleged infringement of Safe Flight's two patents, U.S. Patent Nos. 4,012,713 (the " '713 patent") and 4,079,905 (the " '905 patent"), which cover avionic windshear equipment. In its answer, the defendant asserted six counterclaims: Claims I and II allege that the '713 and '905 patents are not infringed, Claims III and IV allege that the '713 and '905 patents are invalid, Claim V alleges that the patents are unenforceable because of inequitable conduct in the prosecution of the patents, and Claim VI alleges that Safe Flight competed unfairly with the defendant.

We denied the plaintiff's motion for a preliminary injunction by Memorandum Opinion and Order dated August 30, 1988. On February 17, 1989, we granted the defendant's motion for summary judgment of noninfringement of the '713 and '905 patents.[1] Presently before the Court are five motions: (1) Safe Flight's Motion for Reconsideration of the Grant of Summary Judgment of Noninfringement (D.I. 117); (2) Safe Flight's Motion for Entry of Final Judgment Pursuant to Rule 54(b); (D.I. 105); (3) Safe Flight's Motion for a Stay of Proceedings (D.I. 107); (4) Safe Flight's Motion to Stay Boeing Depositions (which stay, because the depositions have already taken place, would have to be ordered *nunc pro tunc*) (D.I. 103); and (5) Sundstrand's Motion for an Order Compelling the Production of Documents (D.I. 109). All five motions are ripe for our consideration and will be addressed *seriatim*.

[1] This decision, in effect, granted the defendant's first two counterclaims which allege noninfringement.

1. *Safe Flight's Motion for Reconsideration.*

Safe Flight requests that we reconsider our decision to grant summary judgment of noninfringement to Sundstrand based on the Court of Appeals for the Federal Circuit's decision in *Corning Glass Works* v. *Sumitomo Electric U.S.A., Inc.*, 868 F.2d 1251 (Fed. Cir. 1989). Safe Flight raises three arguments in an attempt to persuade us to vacate our decision. First, according to Safe Flight, "the standard applied by this Court in analyzing whether Sundstrand Parts infringe under the doctrine of equivalents is contrary to the holding in *Corning Glass*." Safe Flight's Opening Brief in Support of Motion for Reconsideration at 4 (D.I. 118). Second, Safe Flight argues alternatively that "there is a factual dispute concerning the equivalency of the accused device and the claimed invention," Opening Brief for Reconsideration at 7, and that "equivalence is an undisputed fact in this case." Safe Flight's Reply Brief in Support of Motion for Reconsideration at 2 (D.I. 121). Lastly, Safe Flight claims that there is a dispute as to whether the '905 patent is infringed. We disagree with each of these contentions.

We do not read the decision in *Corning Glass* as modifying the Federal Circuit's analysis of the issue of equivalency provided in *Pennwalt Corp.* v. *Durland-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987) (in banc), such that a different result is required in this case. As a preliminary matter, we noted that if the *Corning Glass* decision attempted to overrule the Federal Circuit's decision in *Pennwalt*, it could not because *Pennwalt* was decided in banc and *Corning Glass* was not. *See Texas Instruments, Inc.* v. *United States International Trade Commission*, 846 F.2d 1369, 1372-73 (Fed. Cir. 1988) (Nies, J., dissenting).

More importantly, we find more factual similarities between this case and the facts in *Pennwalt* than between this case and

the facts in *Corning Glass*. For instance, in *Pennwalt*, as in this case, the claims at issue were in a means-plus-function format; the claims in *Corning Glass* were not. In *Pennwalt*, as we found in this case, there was no pioneer invention; in *Corning Glass*, there was. In *Pennwalt*, as here, in order to secure a patent over prior art, the patentee amended its claims very specifically to include functional limitations; in *Corning Glass*, there is no indication that any functional claim amendments were made to overcome prior art. Furthermore, as in *Pennwalt*, the patentee in this case sought then to evade those very specific claim limitations by asserting the doctrine of equivalents; the patentee in *Corning Glass* did not. Finally, in *Corning Glass* the Court could find equivalence under the "All Elements" rule. *Corning Glass*, 868 F.2d at 1259 (citing *Pennwalt*, 833 F.2d at 935). Because of the undisputed facts underlying summary judgment here, we cannot find such equivalence. We conclude therefore that *Corning Glass* does not require us to alter our decision to enter summary judgment of noninfringement.

We reject Safe Flight's argument that there is a factual dispute regarding the issue of equivalency and Safe Flight's alternative assertion that equivalency is undisputed. As the court in *Corning Glass* noted, "[w]hat constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case." 868 F.2d at 1260 (quoting *Graver Tank & Manufacturing Co.* v. *Linde Air Products Co.*, 339 U.S. 605, 609 (1950)). Safe Flight has raised no new arguments and has brought to life no facts not already considered by this Court in our analysis of equivalency between the accused parts and the claimed parts. We conclude, therefore, that *Corning Glass* does not require any alteration of the conclusions reached in our Opinion of February 17, 1989.

Moreover, we reject Safe Flight's arguments that there is a dispute as to whether the '905 patent is infringed. The '905

patent comprises the same windshear detection elements of the '713 patent, with the addition of a downdraft drift angle. *Safe Flight Instrument* v. *Sundstrand Data Control*, 706 F. Supp. 1146, 1147 (D. Del. 1989). Safe Flight made arguments to the Patent and Trademark Office (the "PTO") in its prosecution of the '905 patent which were identical to arguments made to the PTO to distinguish the '713 patent over the prior art. As such, these arguments are part of the prosecution history estoppel of the '905 patent even though, because of the amendments already made to obtain the '713 patent, the claims of the '905 patent did not have to be modified by successive applications to the PTO. *See Hughes Aircraft Co.* v. *United States*, 717 F.2d 1351, 1362 (Fed. Cir. 1983). The arguments presented to the PTO limit the scope of the '905 patent and the range of equivalents to be afforded to it in the same manner that the '713 patent is limited. Thus, neither patent is afforded a wide range of equivalents. We find, therefore, no merit in Safe Flight's contention that there is a dispute as to whether the '905 patent is infringed.

For all of the foregoing reasons, Safe Flight's Motion for Reconsideration will be denied.

2 & 3. *Safe Flight's Motion for Entry of Final Judgment and Motion for a Stay of Proceedings.*

Having denied Safe Flight's Motion for Reconsideration, we consider next whether it is appropriate to enter a final judgment under Rule 54(b) of the Federal Rules of Civil Procedure by certifying our Opinion and Order of February 17, 1989, granting summary judgment of noninfringement. The decision to enter a final judgment under Rule 54(b) is left to the sound discretion of the trial judge. This decision, which is accorded substantial deference on review, is permissible upon an express finding that there is "no just reason for delay."

Fed. R. Civ. P. 54(b). The essential inquiry is "whether after balancing the competing factors, finality of judgment should be ordered to advance the interests of sound judicial administration and justice to the litigants." *Curtiss-Wright Corp.* v. *General Electric Co.*, 446 U.S. 1, 5 (1980).

In *Curtiss-Wright*, the Supreme Court listed with approval several factors which the district court considered in determining that certification of a judgment under Rule 54(b) was appropriate: (1) whether certification would result in unnecessary appellate review by having to decide the same issues more than once if there were subsequent appeals; (2) whether the claims are separate, distinct and independent of any of the other claims or counterclaims involved; (3) whether review of the claims would not be mooted by future developments in the case; and (4) whether the balance of the financial hardships involved favors certification. *Curtiss-Wright*, 446 U.S. at 6. In addition, in *U.S. Golf Association* v. *St. Andrew Systems*, 749 F.2d 1028 (3d Cir. 1984), the Court of Appeals for the Third Circuit, in interpreting *Curtiss-Wright*, stated that entry of a final judgment under Rule 54(b) is appropriate if unsettled issues would be clarified on appeal. 749 F.2d at 1031 n.5. Lastly, the Supreme Court held that "the mere presence of [nonfrivolous counter]claims does not . . . render Rule 54(b) certification inappropriate." *Curtiss-Wright*, 446 U.S. at 9.

We find in this case that there is no just reason for delay. Therefore our decision granting summary judgment of noninfringement will be entered as a final judgment for immediate appellate review.

As we have already stated, the essential question in determining whether to grant Rule 54(b) certification is whether the interests of sound judicial administration and justice to the parties is served by entry of a final judgment. In this case, it is clear that both interests are served by entering final judgment for immediate appellate review.

First, during the March 23, 1989, teleconference we asked counsel for the defendant, "If the Federal Circuit should affirm the granting of summary judgment on non-infringement, how would Sundstrand have standing to maintain its counterclaim for invalidity?" Transcript of March 23, 1989, Teleconference at 4 (D.I. 119). Defendant's counsel responded, "Your Honor, I don't think we would even want to press the counterclaim for invalidity." *Id.* at 5. Thus, if this Court's decision is affirmed on appeal, the defendant's counsel has represented to the Court that two of the remaining counterclaims probably would not be pursued.[2] This fact favors entry of a final judgment under Rule 54(b).

Second, although the defendant wishes to persist in maintaining its counterclaim based on the allegation of inequitable conduct before the PTO to support a claim for attorneys' fees, we do not find that the authority relied on by defendant's counsel supports their position that Court time should be spent to enlarge the existing record so that a claim for attorneys' fees can be pursued.

The defendant argues that the decision in *A.B. Chance* v. *RTE Corp.*, 854 F.2d 1307, 1312 (Fed. Cir. 1988), stands for the proposition that it can proceed with the inequitable conduct counterclaim, regardless of whether or not the granting of summary judgment on the noninfringement counterclaim is affirmed. However, our reading of *A.B. Chance* persuades us that, although inequitable conduct is a separate defense to an infringement claim, we need consider it as the basis for an award of attorneys' fees only when evidence in support of that defense is before the Court. In the present case, there has been

[2] Once a summary judgment of noninfringement was affirmed, there is a question of whether this Court would still have jurisdiction to consider a counterclaim of invalidity by Sundstrand since Sundstrand need no longer then be apprehensive of allegations of infringement. *Indium Corp. of America* v. *Semi-Alloys, Inc.*, 781 F.2d 879, 883 (Fed. Cir. 1985); *Millipore Corp.* v. *University Patents, Inc.*, 682 F.Supp. 227, 231-32 (D. Del. 1987).

no motion for summary judgment made on the ground of inequitable conduct. This issue is, therefore, not appropriately before the Court. If the granting of defendant's motion for summary judgment on the ground of noninfringement is upheld, there will be no need to take further proceedings in this matter to develop and consider evidence on the separate defense of inequitable conduct.

Moreover, there is nothing in the *A.B. Chance* opinion to suggest that a defendant, that succeeds in fending off an allegation of patent infringement, should be able to use valuable court time to expand the record to document alleged inequitable conduct before the PTO in order to justify an award of attorneys' fees. We conclude that such a use of judicial resources should not be permitted. In the instant case, the defendant could have pressed the invalidity and/or the inequitable conduct defenses immediately after filing its answer and could have developed the record accordingly to support its allegations. Instead, Sundstrand chose to defend itself against the charges of patent infringement by pressing its defense of noninfringement. Having failed to pursue inequitable conduct and invalidity initially,[3] we think that it would be improper to permit the defendant to continue this litigation merely to seek attorneys' fees.[4] If, therefore, the granting of summary judgment is af-

[3] As we stated in footnote 9 of our Opinion of February 17, 1989, commenting on our discussion of patentable subject matter, "[W]e do not comment on the validity of the plaintiff's patents. . . . [This question] was not raised in this dispute and therefore is not addressed by the Court."

[4] Even if Sundstrand were permitted to advance its claims of inequitable conduct, and even if it were successful in proving inequitable conduct, this does not mean that an award of attorneys fees would be required. As the Court of Appeals for the Federal Circuit stated in *Gardco Manufacturing, Inc.* v. *Herst Lighting Co.*, 820 F.2d 1209, 1215 (Fed. Cir. 1987), "[I]t has not been held that every case of proven inequitable conduct must result in an automatic attorney fee award, or that every instance of inequitable conduct mandates an evaluation of the case as 'exceptional.' After the district court determines that a case is exceptional, *there remains in every case its freedom to exercise its discretion*, 'informed by the court's familiarity with the matter in litigation and

firmed, the issue of inequitable conduct need never be considered. This is further reason to grant certification.

In addition, we find that the factors enumerated in *Curtiss-Wright* and *U.S. Golf* favor certification especially because we will also grant Safe Flight's Motion for a Stay of Proceedings pending the outcome of the appeal. First, unnecessary appellate review would not result regardless of the outcome of the immediate appeal. As our analysis has just demonstrated, if our decision is affirmed, it is likely that the controversy will be concluded. In the event that our decision is reversed, our conclusion of noninfringement will necessarily either be reversed or reversed and remanded to us for further consideration. In either event, the stay of proceedings ensures that certifying the decision of summary judgment of noninfringement will not waste judicial resources because we will not consider the remaining counterclaims unless it is necessary to do so.

The determination of noninfringement in this case can be, and was, done without reference to the subject matter of the remaining counterclaims. Thus, our decision of noninfringement, which we certify, is separate, distinct, and independent of the remaining counterclaims. Although consideration of Sundstrand's counterclaims will likely implicate issues raised by the noninfringement issue, this does not prohibit certification. The stay of proceedings will ensure that the remaining counterclaims, which may involve facts and issues raised in the certified decision of noninfringement, are not considered pending the outcome of the appeal. Thus, a ruling from the Federal Circuit on those issues which may affect the outcome of Sundstrand's counterclaims will be given full consideration in evaluating these counterclaims should that be necessary.

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the interest of justice,' [and deny an award of attorneys' fees.]" (emphasis added) (citing *S.C. Johnson & Son, Inc.* v. *Carter-Wallace, Inc.*, 781 F.2d 198, 201 (Fed. Cir. 1986)).

We also find that review of the noninfringement issue will not be mooted by future developments in the case. Since a stay will be entered, the Federal Circuit's consideration of the appeal will not be affected by any action in our Court. If the Federal Circuit affirms our decision, the litigation will likely be over. If our decision is reversed, proceedings on all the claims will proceed in this Court.

A balance of the financial hardships involved also favors certification. If our decision is upheld, but the defendant still wishes to — and is able to — proceed with its outstanding counterclaims, then only one trial will be necessary. On the other hand, if the Federal Circuit disagrees with our analysis, the stay creates the possibility that all claims can be resolved in one trial. In either instance, certification accompanied by the stay will ensure only one trial. One trial (possibly none in the event of an affirmance) conserves judicial resources and serves the interests of justice for the parties.

Lastly, we find that, if resolution of the remaining counterclaims is necessary, that resolution might involve the analysis of issues necessarily addressed in our decision of noninfringement. Therefore, it is possible that the immediate appeal of our decision to the Federal Circuit will serve to clarify questions of law that will facilitate resolution of the counterclaims, if that should become necessary. As a result, this factor also favors certification.

Therefore, for all of the foregoing reasons, Safe Flight's Motion for Entry of a Final Judgment and Motion to Stay Proceedings will be granted.

4. *Safe Flight's Motion to Stay Boeing Depositions.*

Safe Flight makes this motion to prevent, *nunc pro tunc*, the deposition of several Boeing employees. On February 24,

1989, Safe Flight filed a Motion for a Protective Order Staying the Depositions Noticed in the Confirming Notice of Depositions Filed with the Court on February 23, 1989. (D.I. 103). On March 3, 1989, Sundstrand filed a Notice in Response to this motion, (D.I. 108), allegedly informing the Court that the depositions had taken place and that therefore, Safe Flight's February 23, 1989, Motion was moot. According to Local Rule 4.3, however, Safe Flights filing of its Motion for a Protective Order stays discovery on the subject matter of the motion until further order of the Court. Despite the defendant's counsel's apology, we cannot permit a violation of our Local Rules simply because out-of-town counsel are not familiar with them. Safe Flight's motion to Stay Boeing Depositions will be granted *nunc pro tunc* and under Local Rule 9.2 we will award Safe Flight expenses, including attorneys fees, in connection with the filing of the papers on this motion.

5. *Sundstrand's Motion for an Order Compelling the Production of Documents.*

Because we have granted Safe Flight's Motion for a Stay of Proceedings, resolution of this motion is not necessary at this time. If, after the Federal Circuit issues its decision, it is appropriate for Sundstrand to pursue this Motion and, if Sundstrand wishes to do so, it will be free to renew its Motion at that time.

An appropriate order will follow.

In the United States District Court
for the District of Delaware.

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff,

v.

Civil Action No. 87-545 JRR

SUNDSTRAND DATA CONTROL, INC.,
Defendant.

ORDER

On this 26th day of June, 1989, for the reasons stated in the Court's Memorandum Opinion of this date,

IT IS ORDERED THAT:

1. Safe Flight's Motion for Reconsideration is denied.

2. Having found that there is no just reason for delay, Safe Flight's Motion for Entry of a Final Judgment of this Court's decision of February 17, 1989, granting summary judgment of noninfringement is hereby granted and, pursuant to Rule 54(b) of the Federal Rules of Civil Procedure, a final judgment is entered granting the relief sought by the defendant in Counts I and II of its counterclaims. Our decision is therefore immediately appealable to the Court of Appeals for the Federal Circuit.

3. Safe Flight's Motion for a Stay of Proceedings pending the outcome of its appeal to the Federal Circuit is granted.

4. Safe Flight's Motion for a Stay of Certain Boeing Depositions is granted *nunc pro tunc*, and Safe Flight is awarded

expenses, including attorneys fees, in connection with preparation of the papers on this motion. Safe Flight shall submit an application for fees, supported by affidavits, within two weeks of the date of this order.

5. The Court reserves decision on Sundstrand's Motion for an Order Compelling Production of Documents. If, after the Federal Circuit issues its decision on appeal, Sundstrand is able to and wishes to pursue this Motion, it will be permitted to do so at that time.

/s/ Jane R. Roth
UNITED STATES DISTRICT JUDGE

APPENDIX C.

In the United States District Court
for the District of Delaware.

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff,

v.

Civil Action No. 87-545 JRR

SUNDSTRAND DATA CONTROL, INC.,
Defendant.

Daniel F. Wolcott, Jr., Esquire of Potter, Anderson & Corroon, Wilmington, Delaware
OF COUNSEL: Edward V. Filardi, Esquire, Robert Neuner, Esquire, James J. Maune, Esquire, and Daniel A. DeVito, Esquire of Brumbaugh, Graves, Donohue & Raymond, New York, New York; and David E. Dougherty, Esquire of Bacon & Thomas, Alexandria, Virginia.

Attorneys for Plaintiffs

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Attorneys for Defendants

OPINION
February 17, 1989

ROTH, District Judge

The plaintiff in this action, Safe Flight Instrument Corporation ("Safe Flight"), alleges that the defendant, Sundstrand Data Control, Inc. ("Sundstrand"), infringes its two patents, U.S. Patent Nos. 4,012,713 (the " '713 patent") and 4,079,905 (the " '905 patent"), which cover avionic windshear equipment. We denied the plaintiff's motion for a preliminary injunction by Memorandum Opinion and Order dated August 30, 1988. The defendant has now moved for summary judgment of noninfringement of the plaintiff's patents.

I. FACTS

Windshear, or more specifically microburst, describes an aviation hazard which occurs when a plane on takeoff or landing encounters violent, quick, and local shifts in wind direction. This can result in disaster if the pilot cannot compensate quickly and properly for the changing conditions. Equipment for warning of the presence of windshear can be located either on the ground or on board the aircraft.

The two Safe Flight patents in suit cover on-board systems of detecting windshear. Windshear is measured in these patents by comparing the rate of change of the instantaneous airspeed (the speed of an aircraft measured against the surrounding air) with the change in groundspeed (the speed of an aircraft measured against the earth; this change in speed is also termed "horizontal inertial acceleration") and in the '905 patent, by adding a downdraft angle. As the defendant explained in its Opening Brief and at oral argument, because the two patents are similarly written only claim 1 of the '713 patent needs to be considered. If this claim is not infringed, then no claim of either patent is infringed. Defendant's Opening Brief at 3 (D.I. 54); Transcript of January 30, 1989, Oral Argument at 12 [hereinafter Transcript] (D.I. 95). Claim 1 of the '713 patent reads:

A system for generating a windshear signal representing the windshear condition encountered by an aircraft comprising:

means for generating a signal representing the rate of change of the instantaneous airspeed of the aircraft,

means for generating a signal representing the horizontal inertial acceleration of the aircraft,

means for subtracting the horizontal inertial acceleration signal from the rate of change of the instantaneous airspeed signal to provide a windshear signal representing windshear, and

means for processing said windshear signal to provide an indication representing the magnitude thereof.

Schematically, the Safe Flight patents generates a windshear signal according to the following basic diagram:

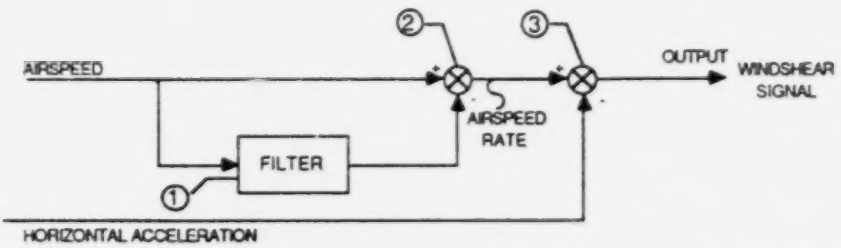

Fig. 2. HORIZONTAL WINDSHEAR COMPUTATION

Affidavit of Philip A. Blythe [hereinafter Blythe Affidavit], Figure 2 (D.I. 81.2).

Sundstrand manufactures and sells several products known as Ground Proximity Warning Systems ("GPWS"). Sundstrand produces three types of GPWS that include a windshear warning capability: Part Numbers 965-0648 ("#648"), 965-0676 ("#676"), and 965-0876 ("#876") (collectively the "Sundstrand Parts"). Part # 648 uses one of The Boeing Company's algorithms[1] to calculate windshear; Parts #676 and #876 use algorithms of Sundstrand's own design to calculate windshear.[2] The following basic diagram represents Sundstrand's commercially produced method for generating a windshear signal:

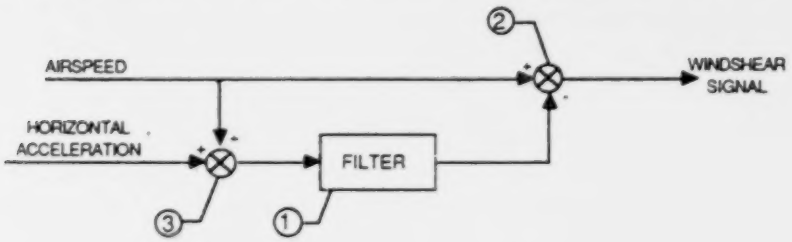

Fig. 3. ALTERNATE WINDSHEAR COMPUTATION

Blythe Affidavit, Figure 3 (D.I. 81.2).

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[1] As described in the Court's previous opinion, Safe Flight entered into a license arrangement with The Boeing Company ("Boeing") to permit "Boeing to manufacture wind shear equipment using the plaintiff's patented technology or to have a third party manufacture such equipment." *Safe Flight Instrument Corp* v. *Sundstrand Data Control, Inc.*, slip op. at 2 (D. Del. Aug. 30, 1988) ("*Safe Flight I*") (D.I. 67). Boeing chose not to manufacture the equipment itself and instead contracted with Sundstrand to produce the wind shear devices to meet its needs. *Id.* at 3.

[2] Although Sundstrand originally briefed its Motion for Summary Judgment of Noninfringement based only on Part #648, Defendant's Opening Brief at 3 (D.I. 54), the plaintiff, in opposing the Motion, argued that all three Parts, #648, #676, and #876, infringe its patents. Plaintiff's Answering Brief at 2 (D.I. 81.1). Sundstrand maintains its position that it is entitled to summary judgment by arguing that none of its parts infringe the plaintiff's patents and by adopting Safe Flight's position that all of Safe Flight's charges against Sundstrand will fail if summary judgment is granted. *See* Defendant's Reply Brief at 1-2 n.1 (D.I. 88); Transcript at 5 (D.I. 95). The analysis in this opinion, therefore, applies to all three Sundstrand Parts and addresses the plaintiff's assertion that all three Parts infringe its patents.

II. ANALYSIS

A. *The Standard for Summary Judgment.* Rule 56 of the Federal Rules of Civil Procedure provides the standard for summary judgment: Summary judgment should be granted when there are no genuine issues of material fact and the movant is entitled to judgment as a matter of law. *Avia Group International, Inc.* v. *L.A. Gear California, Inc.*, 853 F.2d 1557, 1560 (Fed. Cir. 1988) (citing Fed. R. Civ. P. 56); *Moeller* v. *Ionetics, Inc.*, 794 F.2d 653, 657 (Fed. Cir. 1986) (same). Summary judgment is as appropriate in patent cases as in other cases. *Avia Group*, 853 F.2d at 1561 (citations omitted).

The burden of proving that there are no genuine issues of material fact rests on the moving party. *Celotex Corp.* v. *Catrett*, 477 U.S. 317, 323 (1986). Summary judgment may be granted if there is "evidence that is merely colorable . . . or [that] is not significantly probative." *Anderson* v. *Liberty Lobby, Inc.*, 477 U.S. 242, 249-50 (1986) (citations omitted). "Factual disputes that are irrelevant or unnecessary will not be counted." *Id.* at 248. Furthermore, reliance on mere assertions in the pleadings is not permissible. *Id.* There must be enough evidence to enable a reasonable jury to find for the nonmoving party on the issue for which summary judgment is sought. *Id.* at 249; *Avia Group*, 853 F.2d at 1560.

If the nonmoving party fails to make a sufficient showing of an essential element of the case for which that party has the burden of proof, the moving party is entitled to summary judgment as a matter of law. *Liberty Lobby*, 477 U.S. at 322. But the moving party need not "produce evidence showing the absence of a genuine issue of material fact"; it is sufficient for the moving party to demonstrate to the court that the nonmoving party's case is not supported by the evidence. *Avia Group*, 853 F.2d at 1560 (quoting & citing *Celotex*, 477 U.S. at 325).

Finally, it is well-settled law that in a motion for summary judgment the evidence should be viewed in a light most favorable to the nonmoving party, *Adickes* v. *S.H. Kress & Co.*, 398 U.S. 144, 157 (1970), and that this applies with equal force in patent actions. *Avia Group*, 853 F.2d at 1560; *Moeller*, 794 F.2d at 656 (citing *SRI International* v. *Matsushita Electric Corp.*, 775 F.2d 1107, 1116 (Fed. Cir. 1985) (en banc)).

Although the same standard for summary judgment is used in patent cases as in other cases, the standard is somewhat more difficult to meet in patent cases, because not only must no genuine issues of material fact exist, but to grant summary judgment properly, the trial court must in addition construe the claim correctly and conclude that it would not be possible for the trier of fact to find infringement. *Moeller*, 794 F.2d at 656 (citing *Porter* v. *Farmers Supply Service, Inc.*, 790 F.2d 882, 884 (Fed. Cir. 1984)). We address the defendant's arguments with this summary judgment standard in mind.

B. *Infringement Under the Doctrine of Equivalents.* Although Safe Flight argues in its brief that Sundstrand literally infringes both of its patents, Plaintiff's Answering Brief at 24-25 (D.I. 81.1), earlier in its brief Safe Flight indicates that the configuration which Sundstrand commercially produces does not literally infringe its patents, *id.* at 9, and at oral argument Safe Flight did not argue that its patents are literally infringed, but instead argued that its patents are infringed under the doctrine of equivalents.[3] *See* Transcript at 34-35, 37, 39

[3] Although Safe Flight never explicitly abandoned its position that its patents are literally infringed, it is clear to the Court after oral argument that Safe Flight's literal infringement argument is based on one of Sundstrand's pre-production versions of a GPWS with windshear warning that, if produced, would literally infringe the Safe Flight patents. This version is shown in Figure 2, *supra* p. [A18]. The windshear warning system in Sundstrand's commercially produced GPWS with windshear warning is shown in Figure 3, *supra* p. [A19]. *See* Transcript at 39 (first embodiment [Figure 2] refers to a windshear configuration representing the Safe Flight patents and a Sundstrand pre-production

(D.I. 95). We conclude, based on these facts together with our independent evaluation of the Safe Flight patents and the Sundstrand products that the Sundstrand Parts do not literally infringe the Safe Flight patents. Thus, summary judgment will be appropriate if Sundstrand can show that its Parts do not infringe the Safe Flight patents under the doctrine of equivalents or, alternatively, if it can show that Safe Flight's argument that the Sundstrand Parts do infringe its patents under that doctrine is not supported by the evidence.[4]

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version of a GPWS with windshear warning; second configuration [Figure 3] refers to Sundstrand's commercially produced windshear warning system); *id.* at 35 (first schematic [Figure 2] refers to Sundstrand's pre-production version of a GPWS with windshear warning that Safe Flight agrees has not been commercialized by Sundstrand; second schematic [Figure 3] is Sundstrand's present commercial embodiment); Plaintiff's Answering Brief at 8-9 (plaintiff alleging that one arrangement, the first [Figure 2], infringes Safe Flight patents literally; other arrangement, the second [Figure 3], infringes Safe Flight patents under the doctrine of equivalents). Because there has been no allegation before the Court that Sundstrand's pre-production version has ever been produced commercially, we will move onto the relevant analysis required by this controversy: whether the Safe Flight patents have been infringed by Sundstrand under the doctrine of equivalents.

[4] Likewise, we find that the plaintiff's argument based on 35 U.S.C. § 112, ¶ 6 is without merit. Safe Flight argues that this section requires us "to construe the claims of the patents in suit to cover both the means for generating the rate of change of instantaneous airspeed disclosed in the specification . . . and any equivalent means thereof." Plaintiff's Answering Brief at 19. We find the Federal Circuit's statements in *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931 (Fed. Cir. 1987) (en banc), to be controlling. Specifically, there the court stated:

> [S]ection 112, paragraph 6, rules out the possibility that any and every means which performs the function specified in the claim *literally* satisfies that limitation. . . . If the required function is not performed *exactly* in the accused device, it must be borne in mind that section 112, paragraph 6, equivalency is not involved. . . . [It is erroneous to argue that] if an accused structure performs the function required by the claim, it is per se structurally equivalent. That view entirely eliminates section 112, paragraph 6, restriction and has been rejected [by] the . . . precedent of this court.

Id. at 934.

Thus only Safe Flight's argument that its patents are infringed under the doctrine of equivalents will be addressed by the Court.

The doctrine of equivalents has existed since *Winans* v. *Denmead*, 56 U.S. (15 How.) 329 (1853). The Supreme Court's seminal decision on the doctrine was delivered in *Graver Tank & Manufacturing Co.* v. *Linde Air Products Co.*, 339 U.S. 605 (1950). The doctrine of equivalents is an equitable doctrine, at odds with the requirement that patent claims must be precisely worded to warn others of exactly what invention is claimed. *See, e.g.*, *State Industries, Inc.* v. *A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985). The doctrine was developed to provide additional protection to a patentee by permitting him to maintain an action against one who practices his invention but is not within the literal scope of the patent claims. As constructed by the Supreme Court in *Graver Tank*, the doctrine allows a court to find infringement if the alleged infringer produces a device that "performs substantially the same function in substantially the same way to obtain the same result." *Id.* at 608 (quoting *Sanitary Refrigerator Co.* v. *Winters*, 280 U.S. 30, 42 (1929)).

For years, the doctrine of equivalents remained more or less unchanged, being limited only by the fact that "the doctrine [does] not extend (1) to cover an accused device in the prior art, and (2) to allow the patentee to recapture through equivalence certain coverage given up during prosecution." *Pennwalt Corp.* v. *Durand-Wayland, Inc.*, 833 F.2d 931, 934 n.1 (Fed. Cir. 1987) (en banc) (citing *Loctite Corp.* v. *Ultraseal Ltd.*, 781 F.2d 861, 870 (Fed. Cir. 1985)). In *Pennwalt*, the Court of Appeals for the Federal Circuit clarified the doctrine by holding that in order to find infringement under the doctrine of equivalents, a court cannot merely view an invention as a whole, rather it must perform an element-by-element analysis of the patent in suit and must find that each element in the claimed invention, or its equivalent, is found in the alleged infringing product. *Id.* at 935-39.

In *Pennwalt*, the plaintiff alleged that the defendant, Durand-Wayland, infringed claims of its fruit sorter covered by Pennwalt's U.S. Patent No. 4,106,628. After dismissing Pennwalt's contention that its patent was literally infringed, *id.* at 933-34, the court of appeals affirmed the district court's finding that there also was no infringement under the doctrine of equivalents. *Id.* at 934-39. The analysis used by the *Pennwalt* court is applicable in the case *sub judice*.

Initially, the court of appeals in *Pennwalt* stated that "if . . . even a single function required by a claim or an equivalent function is not performed by the Durand-Wayland sorters, the [district] court's finding of noninfringement must be upheld." *Id.* at 936. The district court had identified the relevant difference between the patented device and the alleged infringing device as the fact that certain functions of the claimed inventions were missing from the accused devices. *Id.* at 935. Specifically, the patented device's ability to *continuously* track the positions of the items before each item is discharged and the accused device's inability to do the same was the critical difference between the devices.[5] *Id.*

The court of appeals upheld the district court finding of noninfringement on three grounds. First, the court stated that the plaintiff's expert witness testimony supported the finding that there was no infringement because he testified that the accused device and the patented device perform only "*some of the same type of operations*." *Id.* at 937. The court of appeals found that this testimony, and the absence of any testimony to the effect that the devices performed each and every function of the other, supported the finding by the district court that some of the functions of the patented device were not performed by the accused infringing device. Thus there could be no infringement under the doctrine of equivalents. *Id.*

[5] As discussed *infra*, another difference between the devices was the position of an element in the invention versus the position of a similar element in the alleged infringing sorter. 833 F.2d at 938.

Second, the court of appeals noted that the language of the patent should be construed narrowly based on its prosecution history and on the fact that it was not a pioneer invention. This narrow reading, in accordance with the usual rule that a patentee cannot recapture through the doctrine of equivalents certain coverage given up during prosecution, *supra*, resulted in the conclusion of noninfringement. The court found that since the patented invention was merely an improvement in an already crowded field, the addition of the phrases regarding how the sorter worked in the patented device, specifically as to how it continuously tracked the location of an item in transit, was "crucial to patentability," because these phrases narrowed the claim making it was patentable over the prior art. According to the court, in this type of situation, the patent claim " 'should be read in light of the careful phraseology [of functions] chosen by the inventors' because 'the machine disclosed in the patent-in-suit was carefully described so that it did not read on the prior art.' " *Id.* (quoting *Pennwalt Corp.* v. *Durand-Wayland, Inc.*, 225 U.S.P.Q. (BNA) 558, 570 (N.D. Ga. 1984)). Moreover, because "the accused machine simply *does not do* what . . . 'could' be done," the court of appeals rejected Pennwalt's argument that the accused device necessarily had to infringe its patents because it was possible to find the location of the items using the accused device. *Id.* at 937-38.

Lastly, the court rejected on two grounds Pennwalt's argument that the defendant's shifting of "the position of an operable element" did not preclude a finding of infringement. Pennwalt, in effect, argued that its patent was infringed because, although the accused devices did not make a required comparison between certain values, as prescribed in Pennwalt's patent, the operation and results achieved were the same as those claimed by its patent. First, according to the court, the specific claim language in the patent required that the position indicating means (which was crucial to patentability over the

prior art) be responsive to certain specified signals. *Id.* at 938. The court found that there could be no finding of infringement because the accused device did not include any method to respond to those specified signals. *Id.* Second, the court rejected the plaintiff 's argument that the memory component of the defendant's device, which stored information as to the weight and color of an item, was the same or substantially the same function as the function of "continuously indicating" where an item is located in the sorter. *Id.* Again, the court found it significant that the record in the case was clear that, before the words "continuously indicating" were added as an additional limitation to the patent, it was unpatentable in view of the prior art which, like the accused device, stored information with respect to sorting criteria in its memory but did not "continuously" track the location of any item. *Id.* As the court stated, "the inventors could not obtain a patent in which the functions were described more broadly. Having secured claims only by including very specific *functional* limitations, Pennwalt now seeks to avoid those very limitations under the doctrine of equivalents. This it cannot do." *Id.* (citations omitted).

Thus, after *Pennwalt*, for infringement to exist under the doctrine of equivalents, an element-by-element identity must exist between the patented invention and the alleged infringing product. Further, a finding of infringement will not be supported: (1) when the plaintiff's expert testimony fails to preclude a finding that there are substantial differences between the patented device and the accused device; (2) where the prosecution history and nature of the patent have limited the patent to a narrow reading, especially where the specific claim language in the patent requires certain functions to be performed and the accused device does not perform these functions, even though there exists the possibility that the accused device could perform them; and (3) where the plaintiff's claims of infringement are based on an argument that the operation

and results achieved by the accused device are the same as those claimed by the plaintiff's patent, but certain functions added to achieve patentability are not present in the accused device.

Using this standard to determine infringement under the doctrine of equivalents, there is no infringement in this case. Safe Flight's patents claim a system for generating a signal representing windshear. It claimed this system very specifically. Its signal representing windshear is produced by a system that has: (1) the means for generating a signal representing the rate of change of the instantaneous airspeed of the aircraft; (2) the means for generating a signal representing the horizontal inertial acceleration of the aircraft; (3) the means for subtracting the horizontal inertial acceleration signal from the rate of change of the instantaneous airspeed signal to provide a windshear signal representing windshear; and (4) the means for processing the windshear signal to provide an indication representing the magnitude thereof. In the Sundstrand Parts, it is impossible to identify either the first or the third step in the Safe Flight patents. An isolated signal representing the rate of change of the instantaneous airpseed of the aircraft cannot be identified in the Sundstrand Parts. Similarly, the third step, wherein the horizontal inertial acceleration signal is subtracted from the airspeed rate, cannot be identified in the Sundstrand Parts. Thus, the required element-by-element comparison results in the conclusion that there is no infringement under the doctrine of equivalents and supports the conclusion that Sundstrand is entitled to summary judgment of noninfringement as a matter of law.

Additionally, none of Safe Flight's expert witnesses has either submitted an affidavit or testified during a deposition that it is possible to identify an isolated signal representing the rate of change of the instantaneous airspeed of the aircraft. Thus, we find that there are significant differences between the Safe Flight patents and the Sundstrand Parts and that this

finding has not been refuted by the plaintiff's experts. This analysis therefore reinforces our finding that the defendant is entitled to summary judgment of noninfringement.

It is also relevant in this case to examine the prosecution history of the Safe Flight patents after noting that the patents are not pioneer patents in the field of windshear equipment. *See, e.g.*, Petersen Affidavit, Exhibit 5, Nov. 5, 1976, Response to Official Action at 1-3 (discussing the Lambregts and Scholeman patents) (D.I. 55); *Id.*, Exhibit 6, Feb. 7, 1977, Request for Examination at 1-11 (discussing 10 patents as prior art including the Lambregts patents) (D.I. 55).

As first presented to the Patent and Trademark Office (the "PTO"), the '713 patent was rejected as unpatentable over the prior art. Petersen Affidavit, Exhibit 5, Nov. 5, 1976, Response to Official Action at 2 (D.I. 55). At that time, the claims were amended to use the term "representing" in place of the term "in accordance with" in the original submission. *Id.* at 1. As the applicant stated in the Response to the rejection, the effect of this replacement was to remove the application from the scope of the prior art because the term "in accordance with" was so broad that it could reasonably be interpreted to read on the prior art, but the term "representing" could not read on the prior art. *Id.* at 2-3. In its brief, the plaintiff admits that substituting "representing" for "in accordance with" narrowed the scope of the claims. Plaintiff's Answering Brief at 29 (D.I. 81.1). The claims were narrowed because the prior art disclosed signals that were functions of windshear and which contained the variables necessary to calculate windshear. However, signals covered by the prior art did not actually *represent* any of these values. Thus, it was the applicant's position that "in accordance with" permitted signals to be a function of the values which they were supposed to indicate, but that "representing" did not. It was on this basis that the claims were finally allowed.[6]

[6] The '905 patent was similarly worded to avoid the same problems. Petersen Affidavit, Exhibit 4, Greene '905 patent, at Column 6 (D.I. 55); *id.*, Exhibit

We find that the *Pennwalt* court's language is applicable here: The patent claims " 'should be read in light of the careful phraseology [of functions] chosen by the inventors' because 'the [device] disclosed in the patent-in-suit was carefully described so that it did not read on the prior art.' " *Id.* (quoting *Pennwalt*, 225 U.S.P.Q. (BNA) at 570). Safe Flight's argument that the windshear signal is the signal that represents the rate of change of the instantaneous airspeed is therefore misguided, as it seeks to reclaim part of what was given up during the prosecution of its patents. Plaintiff's Answering Brief at 32-34 (D.I. 81.1). Had Safe Flight not replaced the "in accordance with" language with "representing," its argument that the signal "in accordance with windshear" is also the signal "in accordance with the rate of change of the instantaneous airspeed" would probably have merit, but, then again, Safe Flight would not have been granted the patents had it not narrowed the scope of these claims. Because it is unacceptable to "allow the patentee to recapture through equivalence certain coverage given up during prosecution," *Pennwalt*, 833 F.2d at 934 n.1, this analysis supports our conclusion that the defendant is entitled to summary judgment of noninfringement as a matter of law.

Finally, Safe Flight, like the plaintiff in *Pennwalt*, unpersuasively argues that a change in the "position of an operable element" in the claimed invention is insufficient to remove the accused device from the scope of its patent. Plaintiff's Answering Brief at 33 (D.I. 81.1). Here, it is significant that Safe Flight argues that the change in placement of the summation device in the windshear circuit makes no difference in the *overall* calculation. *Id.* Assuming that this is true, the plaintiff's position would have merit only if *no* difference, either step-by-step or overall, resulted from the change in placement of the

6, Feb. 7, 1977, Request for Examination. Thus, our analysis of the effect of the term "representing" in the '713 patent applies to the '905 patent, as well.

summation device.[7] The change in structure of the elements to calculate the signal representing windshear in the Sundstrand Parts does, however, result in a difference. As we stated earlier, in the Sundstrand Parts it is impossible to locate a signal representing the rate of change of the instantaneous airspeed. This difference is significant, and as the court in *Pennwalt* noted, a patentee, by application of the doctrine of equivalents, cannot avoid language added to patent claims to make a rejected patent application patentable. This analysis, like the others already performed, supports the conclusion that the defendant is entitled to summary judgment of noninfringement as a matter of law.

C. *Patentable Subject Matter*. Safe Flight, however, contends that a genuine issue of material fact exists because it claims, in fact, that there is a dispute over whether Sundstrand has a means for producing a signal representing the rate of change of the instantaneous airspeed of the aircraft. Safe Flight argues that the Sundstrand Parts necessarily have the means for producing such a signal because its Parts produce a windshear signal. According to Safe Flight, because windshear is the difference between the rate of change of the instantaneous airspeed and the horizontal inertial acceleration, then necessarily, the rate of change of the instantaneous airspeed is contained within the windshear signal and if one wanted to, one could find out the value of that signal by analyzing the signal repre-

[7] The summation device is labelled "3" in Figures 2 and 3 *supra* [pp. A18, A19]. By way of illustration, if the Safe Flight and Sundstrand filters contained the exact same electronic elements, but were arranged differently, this difference would not matter if the two filters were fed the same input and produced the same output, and Safe Flight's position would have merit. Here, however, the filters do not receive the same input. The different arrangement of the filter and of the summation device means that there is different input to the filter, producing a different output from the filter, albeit the same final result is produced in the wind shear signal. This difference is significant and thus, pursuant to *Pennwalt*, Safe Flight's position is without merit.

senting windshear. *See* Plaintiff's Answering Brief at 30-34. This argument, however, is a tautological circle that is unsupported in the law.

Safe Flight cannot patent the concept of windshear. *Diamond* v. *Diehr*, 450 U.S. 175, 185 (1981). As the Supreme Court stated in *Diehr*:

> Excluded from . . . patent protection are laws of nature, *natural phenomena*, and abstract ideas. . . . An idea of itself is not patentable. . . . [In this respect], 'Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity. Such discoveries are "manifestations of . . . nature, free to all men and reserved exclusively to none."'

Id. (quoting *Diamond* v. *Chakrabarty*, 447 U.S. 303, 309 (1980)) (other citations omitted) (emphasis added). Thus, if we were to accept Safe Flight's argument that Sundstrand infringes its patents because the Sundstrand Parts produce a windshear signal, part of which is necessarily a "signal" representing the rate of change of the instantaneous airspeed of the aircraft, we would preclude all other companies from producing windshear alert systems. This we will not do.

In *Diehr*, the respondents filed a patent application that claimed an invention covering a process for molding raw, uncured synthetic rubber into cured precision products. *Id.* at 177. Among the many variables that enter into the curing process, controlling the cure time had always presented a problem. *Id.* It was industry practice to calculate the cure time by use of the Arrhenius equation which is dependent on well-known time, temperature, and cure relationships, but it was difficult to measure the temperature of the curing press, the

only unknown variable in the equation.[8] *Id.* at 177-78. The respondents claimed to have solved this problem by measuring the temperature inside the mold constantly and by feeding these measurements into a computer which repeatedly recalculated the cure time by use of the Arrhenius equation. *Id.* at 178. The respondents claimed that the continuous measurement of the temperature inside the mold, the transfer of this information to a computer, the continuous calculations performed by the computer, and the signalling by the computer to open the press when the curing process was complete were all new to the art. *Id.* at 179.

Initially, the patent examiner rejected the claims as being unpatentable because the claims covered nonstatutory subject matter under 35 U.S.C. section 101 in that he determined that "the claims defined and sought protection of a computer program for operating a rubber-molding process." *Id.* at 179-81. Although on appeal the claims were held allowable by the Court of Customs and Patent Appeals, *In re Diehr*, 602 F.2d 982 (C.C.P.A. 1979), the Supreme Court granted certiorari to clarify the standard to be applied.

The Supreme Court held that the claims were proper subject matter for a patent. *Id.* at 184. The Court viewed the respondent's claims as covering an industrial process for curing rubber and concluded that such processes historically enjoyed the protection of the patent laws. *Id.* & n.8. Careful to note that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm," *id.* (quoting *Parker*

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[8] The Arrhenius equation for rubber curing can be expressed as follows:

$$\ln v = cz + x$$

wherein ln v is the natural logarithm of the v, the total cure time; c is the activation constant which is unique to the particular composition of the material being molded; z is the temperature of the mold; and x is a geometric constant unique to the configuration of the particular mold. Thus, assuming that the constants, c and x, are computed accurately, it is critical to measure z accurately, otherwise the cure time will be inappropriate. 450 U.S. at 177 & n.2.

v. *Flook*, 437 U.S. 584, 590 (1978)), the Court rejected the notion that the subject matter was unpatentable even though several steps in the process relied on a mathematical formula. *Id.* at 185. However, the Court came to this conclusion only after restating the notion that "laws of nature, natural phenomena, and abstract ideas," *supra*, are not patentable and finding that the respondents did not seek to patent the Arrhenius equation, the mathematical formula employed by its computer in its patent. *Id.* at 187. As the Court stated, "Their process admittedly employs a well-known mathematical equation, *but they do not seek to preempt use of that equation*. Rather they seek only to foreclose from others the use of that equation in conjunction with *all* the other steps in their claimed process." *Id.* (emphasis added). It was only when viewed in this light that the Court held that the claims covered patentable subject matter.

In the present controversy, Safe Flight describes its method for calculating windshear alternatively as an algorithm or an algebraic expression. *See, e.g.*, Plaintiff's Answering Brief at 32 (D.I. 81.1); Transcript at 32, 34-35, 38 (D.I. 95). Unlike the respondents in *Diehr*, the plaintiff here *does* seek to preempt use of the general windshear equation. If we were to adopt Safe Flight's argument, it would enjoy complete insulation from any company that marketed a product that produces a windshear signal. Windshear is represented by the difference between the rate of change of the instantaneous airspeed of the aircraft and the horizontal inertial acceleration. Thus, a system that produces a signal representing windshear would necessarily have the means for producing signals representing the rate of change of the instantaneous airspeed and horizontal inertial acceleration. It logically follows that every system that would produce such a signal would thereby infringe Safe Flight's patent claims. To adopt Safe Flight's argument would permit Safe Flight, in effect, to patent the windshear equation.

This it cannot do. Safe Flight can patent the use of the windshear signal in its airplane control systems once that signal has been produced, as long as it seeks protection for the use of the windshear equation in conjunction with all of the other steps in the system. It cannot, however, as it seeks to do here, prevent others from using the equation which simply describes a natural phenomenon.[9] *Diehr*, 450 U.S. at 185, 191-92.

III. CONCLUSION

The Sundstrand Parts do not literally infringe the Safe Flight patents. Performing an element-by-element comparison of the functions performed by the Sundstrand Parts and the functions claimed by the Safe Flight patents, we further conclude that Sundstrand does not infringe the Safe Flight patents under the doctrine of equivalents. Safe Flight has produced no evidence to contradict our finding that the Sundstrand Parts are substantially different from the invention claimed in the Safe Flight patents in that it is impossible to locate an isolated signal representing the rate of change of the instantaneous airspeed in the Sundstrand Parts. The prosecution history of the patent supports a strict and narrow reading of the claim language which leads to the conclusion that there is no infringement by Sundstrand. Safe Flight's argument that Sundstrand's relocation of the summation circuit in its Parts is not significant misapplies the doctrine of equivalents and is not supported by the claim histories of its patents. Our conclusion that the Sundstrand Parts do not infringe the Safe Flight patents is further supported by the Supreme Court's decision in *Diamond* v.

[9] In so finding, we do not comment on the validity of the plaintiff's patents. We only refuse to permit Safe Flight to preclude others from use of the general windshear equation. The question of whether its patents cover more than the general windshear equation (and therefore whether its patents cover patentable subject material) was not raised in this dispute and therefore is not addressed by the Court.

Diehr wherein the Court unequivocally restated the historic rule that "a mathematical formula is not granted the protection of our patent laws." *Id.* at 191 (citing *Gottschalk* v. *Benson*, 409 U.S. 63 (1972)). Since Safe Flight cannot patent an algorithm representing a natural phenomenon, and for all of the other foregoing reasons, the defendant's motion for summary judgment of noninfringement will be granted.

An appropriate order will follow.

In the United States District Court

for the District of Delaware.

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff,

v.

Civil Action No. 87-545 JRR

SUNDSTRAND DATA CONTROL, INC.,
Defendant.

ORDER

On this 17th day of February, 1989, for the reasons stated in the Opinion of this date,

IT IS ORDERED that defendant's motion for summary judgment of non-infringement is granted.

/s/ Jane R. Roth
UNITED STATES DISTRICT JUDGE

APPENDIX D.

United States Court of Appeals for the Federal Circuit

89-1579

SAFE FLIGHT INSTRUMENT CORPORATION,
Plaintiff-Appellant,

v.

SUNDSTRAND DATA CONTROL, INC.,
Defendant-Appellee.

ORDER

Before NIES, Circuit Judge, NEWMAN, Circuit Judge, and MICHEL, Circuit Judge.

A petition for rehearing having been filed in this case, UPON CONSIDERATION THEREOF, it is

ORDERED that the petition for rehearing be, and the same hereby is, denied.

The mandate will issue on April 27, 1990.

FOR THE COURT

/s/ _____
Francis X. Gindhart
Clerk

Dated: April 20, 1990